Development of Government Schools in Orangi Town, Karachi

A GIS based Case Study

International Conference on Space
12\textsuperscript{th} to 14\textsuperscript{th} November, 2014

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Summary

• Introduction
• Objectives
• Study area
• Data used
• Methodology
• Results
• Conclusions
Introduction

- Education is a fundamental right of every individual
- In Pakistan situation is different
  - Insufficient number of schools
  - Insufficient number of teachers
  - Inadequate infrastructures of schools buildings
- Poverty is also a factor that restricts parents to send their children to schools
Objectives

• Temporal Analysis of Schools from 2001 to 2013

• To find out ratio between Population and Schools (2001 & 2013)

• To find out ratio between 5-9 year age group population and schools

• To analyze Proximity of schools to population
Study Area

Sindh

Karachi

Orangi Town

Orangi Town Boundary

Union Councils

0 0.75 1.5 3 Kilometers

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data used

1. Union council (UC) map of Orangi Town from Karachi Metropolitan Corporation
2. Google Earth Archive maps to find out temporal increase in number of schools for the span of twelve (12) years
3. UC wise population data of Orangi Town from Karachi Metropolitan Corporation (KMC)
Methodological Framework

Data Collection
- Maps of Orangi town from KMC
- Population Data of Orangi town
- iMMAP Schools data

Data Processing
- Georeferencing of Orangi Town Maps
- Conversion of Schools Tabular Data of 2013 into Shapefile
- Digitization and Geo-database development
- Check Existence of schools in 2001 using Google Earth Archive maps

Analysis
- Temporal Increase of Schools
- Proximity Analysis of Serving Population
- Population 1998 and 2013 (for the year of 2013 pop projected \( P = P_0 e^{rt} \))
- Ratio between schools, population and 5-9 year age group of population

Results and Maps
Increase in Number of Schools between 2001-2013

- Google Earth Archive maps used to find out temporal increase in number of schools for the span of twelve (12) years.

<table>
<thead>
<tr>
<th>Name</th>
<th>UC. No.</th>
<th>Schools (2001)</th>
<th>Schools (2013)</th>
<th>New Schools In 12 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azad Nagar</td>
<td>1</td>
<td>6</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Haryana colony</td>
<td>2</td>
<td>0</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Hanfiabad</td>
<td>3</td>
<td>4</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Muhammad Nagar</td>
<td>4</td>
<td>8</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Madina colony</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Ghaziabad</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Chushti Nagar</td>
<td>7</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Bilal Colony</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Islam Chowk</td>
<td>9</td>
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<td>4</td>
<td>0</td>
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<tr>
<td>Gabol Colony</td>
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<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Dada Nagar</td>
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<td>9</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Mujahidabad</td>
<td>12</td>
<td>2</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Baloch Goth</td>
<td>13</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>
Population to Schools Ratio

- Population to school ratio in each UC is calculated by dividing the UC population with number of schools.
Ratio between 5-9 Year Age Group Population and Schools

- 5-9 year age group of population considered as primary school going children
- It is assumed that 20% of population belongs to 5-9 year age group*

*Pakistan statistical year book of 2011
Proximity Analysis

• Orangi Town comprises of low income group residents
• People living far from schools hesitate to send their children with an additional conveyance cost
• Euclidean Distance is employed to visualize the distances of existing schools from the settlements of the Orangi Town
• New schools are proposed where population is living far from schools at a distance more than 500m
Proximity Analysis

Walking Distance From Existing and Purposed Schools

- **Schools**
- **Proposed Schools**

Legend:
- 0 - 500
- 500 - 1,000
- 1,000 - 1,500
- 1,500 - 2,000
- 2,000 - 2,500

Scale:
- 0 - 500
- 500 - 1,000
- 1,000 - 1,500
- 1,500 - 2,000
- 2,000 - 2,500

Distance:
- 0 - 2,000
- 2,000 - 2,500

Legend Key:
- Cross: Existing Schools
- Triangle: Proposed Schools
Conclusion

• Satellite data and GIS techniques are effectively used to analyze schools growth during last twelve (12) years in Orangi town
  – Population growth rate is higher than the rate of increase of schools
  – Proximity analysis reveals some unserved settlements based on the maximum threshold distance of 500 meters from the existing schools
  – Sites for the construction of new school buildings identified
Thank you